

AMENDMENTS TO THE DRAWINGS

A new Fig. 3 is attached. It differs from Fig. 2 in that a driven heated belt 34a replaces a driven hot roll. Support for the driven heated belt can be found in originally filed claim 12. No new matter is involved.

REMARKS/ARGUMENTS

In the Office Action, the drawings were objected to because a fuser assembly including a belt is not shown. A new Fig. 3 is attached. It differs from Fig. 2 in that a driven heated belt 34a replaces a driven hot roll. Support for the driven heated belt can be found in originally filed claim 12. No new matter is involved.

Applicants confirm that the subject matter of all claims was commonly owned at the time the inventions covered therein were made.

Further in the Office Action, claims 1-3, 8, 10, 12-14, 20 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,381,422 to Tanaka and U.S. Patent No. 4,188,109 to Idenawa et al.; claims 4, 5, 15 and 16 were rejected under § 103(a) in view of the '422 patent, the '109 patent and U.S. Patent No. 5,819,149 to Watanabe et al.; claims 6, 7, 18 and 19 were rejected under § 103(a) in view of the '422 patent, the '109 patent and U.S. Patent No. 6,567,640 to Ishikawa et al.; and claims 9 and 22 were rejected under § 103(a) in view of the '422 patent, the '109 patent and U.S. Patent No. 6,567,624 to Murata.

The Office Action states on page 4:

Tanak *** does not disclose creating a bubble, the transport assembly moving at a first operating speed and the fuser roll rotating at a second operating speed. *** It would have been obvious to one of ordinary skill in the art at the time of the invention to move the transport assembly at the claimed first operating speed, move the fuser roll at the claimed second operating speed, and creating a bubble, as disclosed by Idenawa et al. ***, since such first and second operating speeds and creation of a bubble prevents wrinkling of the sheet.

U.S. Patent No. 6,381,422 to Tanaka teaches "an image forming apparatus which controls a fixation speed by fine adjustment in accordance with control of a fixation temperature," see column 10, lines 3-5. U.S. Patent No. 4,188,109 to Idenawa et al. teaches providing slack in a substrate between a feed roller assembly and a fuser assembly so as to reduce substrate wrinkling resulting from the longitudinal axes of the fuser rollers being positioned at an angle to one another. The Tanaka patent does not disclose fuser rolls having longitudinal axes positioned at an angle to one another. Since the fuser rolls in the Tanaka patent are not positioned at an angle to one another, there is no substrate wrinkling problem that needs to be corrected in the Tanaka patent in the manner discussed in the Idenawa et al. patent. It is further noted that neither the Tanaka patent nor the Idenawa et al. patent disclose, teach or suggest "rotating said fuser roll at a

second operating speed which is dependent upon said determined temperature such that a bubble in the print medium between said paper transport assembly and said fuser assembly is created,” as recited in claim 1, or “driving said driven member at a second operating speed which is dependent upon said determined temperature such that a bubble is created in the print medium between said print medium transport assembly and said fuser assembly,” as recited in claim 12. Nor are these limitations disclosed, taught or suggest by U.S. Patent No. 5,819,149 to Watanabe et al., U.S. Patent No. 6,567,640 to Ishikawa et al., or U.S. Patent No. 6,567,624 to Murata.

It is further noted that the ‘422 patent to Tanaka teaches in column 9, lines 25-67:

In the image formation unit having the above-described structure, there are some problems when a heating temperature in the fixation unit is controlled in order to heat/fuse the development material while matching the carriage speeds of the transfer unit 20 and the fixation unit 5. For example, when the fixation speed is set to a very low speed on the safe side, the fixation unit 5 does not have to forcibly pull out the paper from the transfer unit 20 and the image formation position is not displaced even if the heat roller 6 or the press roller 7 thermally expands so that the diameters of the both rollers increases and the speed for carrying the paper becomes high to some extent which results in that the speed for sending the paper from the transfer unit 20 side does not math with the speed for pulling the paper by the fixation unit 5.

In this case, however, since the carriage speed on the fixation unit 5 side is delayed from the carriage speed of the transfer unit when the fixation unit 5 side does not thermally expand, slack of the paper such as shown in FIG. 2 is generated between the fixation unit 5 and the transfer unit 20, and contact made between the peripheral components and the paper produces an "image friction" phenomenon formed by an unfixed development material.

In particular, in the color image forming apparatus, since a registration sensor 16 as a shift detector provided for controlling color superimposition shift is so arranged as to be opposed to the surface of the transfer belt 21 in close proximity, a gap between the surface of the passing paper and the registration sensor 16 is set narrow, and a spatial margin is not assured. Therefore, the isolation distance between the transfer unit 20 and the fixation unit 5 can not be satisfactorily assured. When slack on this part of the paper is absorbed on the safe side, the size of the entire apparatus increases, and the efficiency of the space utilized by a user may be consequently limited.

Therefore, in the image forming apparatus according to the present invention, the relative relationship between the standard transfer belt and the carriage speed of the fixer is set as a reference, and the paper carriage speed of the fixing portion is changed by fine adjustment control in accordance with a

variation in a fixation temperature so that the relationship of the relative speed can be substantially constantly maintained.


Hence, Tanaka teaches away from the suggested combination of references. In essence, the Tanaka patent teaches in the paragraphs set out above that having a speed mismatch such that slack is created in the paper is undesirable as the slack in the paper may cause the paper to contact components of the printer. To avoid contact with components in the printer, the Tanaka patent teaches that the “size of the entire apparatus [would need to be] increased, and the efficiency of the space utilized by a user may be consequently limited.”

Accordingly, it is submitted that U.S. Patent No. 6,381,422 to Tanaka; U.S. Patent No. 4,188,109 to Idenawa et al.; U.S. Patent No. 5,819,149 to Watanabe et al.; U.S. Patent No. 6,567,640 to Ishikawa et al.; and U.S. Patent No. 6,567,624 to Murata, whether taken singly or in combination, do not disclose, teach or suggest the subject matter set out in claims 1-23.

With this paper, claims 10 and 23 have been amended to recite that the second operating speed corresponds to a linear speed that is slower than the first operating speed. No new matter is involved.

In view of the above remarks, applicants submits that claims 1-23 define patentably over the prior art. Early notification of allowable subject matter is respectfully requested.

Respectfully submitted,
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